



2006

**Water Quality Assessment
and
Impaired Waters
Integrated Report**

Virginia Department of Environmental Quality

July 2006



Public Comment

- Public comment period July 10 - August 11
- Download Integrated Report via DEQ website
 - <http://www.deq.virginia.gov/wqa/>
 - Maps available at <http://www.gisweb.deq.virginia.gov/>
- 7 public meetings held around Virginia
- Comments received by first class mail to:
 - Darryl M. Glover, DEQ Water Quality Monitoring and Assessment Manager, P.O. Box 10009, Richmond, Virginia 23240-0009
- and via e-mail attachment to dmglover@deq.virginia.gov

Summary

- Assessments in 87 % of watersheds since 2002
- 2,053 newly impaired river/stream miles in 2006
- Bacteria, PCBs, and low D.O. are causes of most impairments requiring TMDLs in VA waters
- D.O. levels in Virginia mainstem Chesapeake Bay better than Virginia tributary rivers
- Beginning to implement TMDL related cleanups

Background

- Clean Water Act and the Virginia Water Quality Monitoring, Information and Restoration Act require state to assess and report on the quality of state waters.
- 2002 - published separate 305(b) Water Quality Assessment report and 303(d) Report on Impaired Waters
- 2003 - EPA promoted an integrated (combined) report
- 2004 - Virginia publishes its first Integrated Report
- 2006 - First assessment of new Chesapeake Bay WQS

Key Factors For 2006 Assessment

- Assessment Period: January 2000 - December 2004
- Data from over 5000 stations used
- Enhanced use of Citizen and Non-Agency data
- Updated Trend Analysis
- VDH Fishing Advisories:
 - Mercury and PCB thresholds lowered
 - 12 Mercury; 39 PCBs; 1 Kepone
- VDH data on public beaches
- Shifting to Small (6th Order-12 Digit) Watersheds
- First assessment of Chesapeake Bay WQS - D.O., SAV
 - 600 assessment units are now combined into 36 segments for D.O.

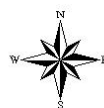
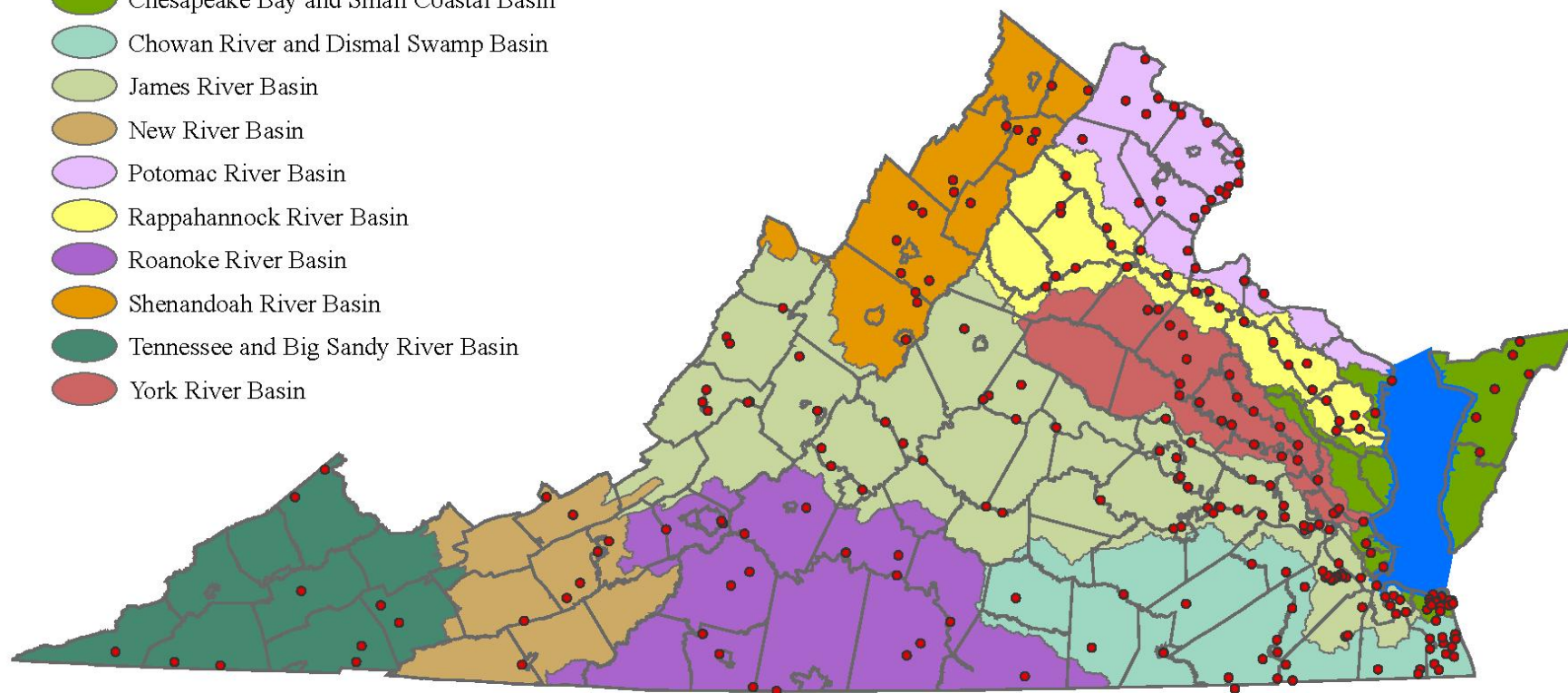
Use of Citizen Monitoring Data

- 447 Citizen monitoring stations met the highest level of Quality Assurance
- For the 2006 report, DEQ independently assessed 80.82 river miles from citizen volunteer data
- In future assessments, will assess more citizen monitored sites independently
- By the 2010 assessment, DEQ will assess 3,000 stream miles using citizen data

Distribution of 2006 Trend Analysis Stations

Virginia River Basins

- Chesapeake Bay and Small Coastal Basin
- Chowan River and Dismal Swamp Basin
- James River Basin
- New River Basin
- Potomac River Basin
- Rappahannock River Basin
- Roanoke River Basin
- Shenandoah River Basin
- Tennessee and Big Sandy River Basin
- York River Basin



0 12.5 25 50 75 100 Miles



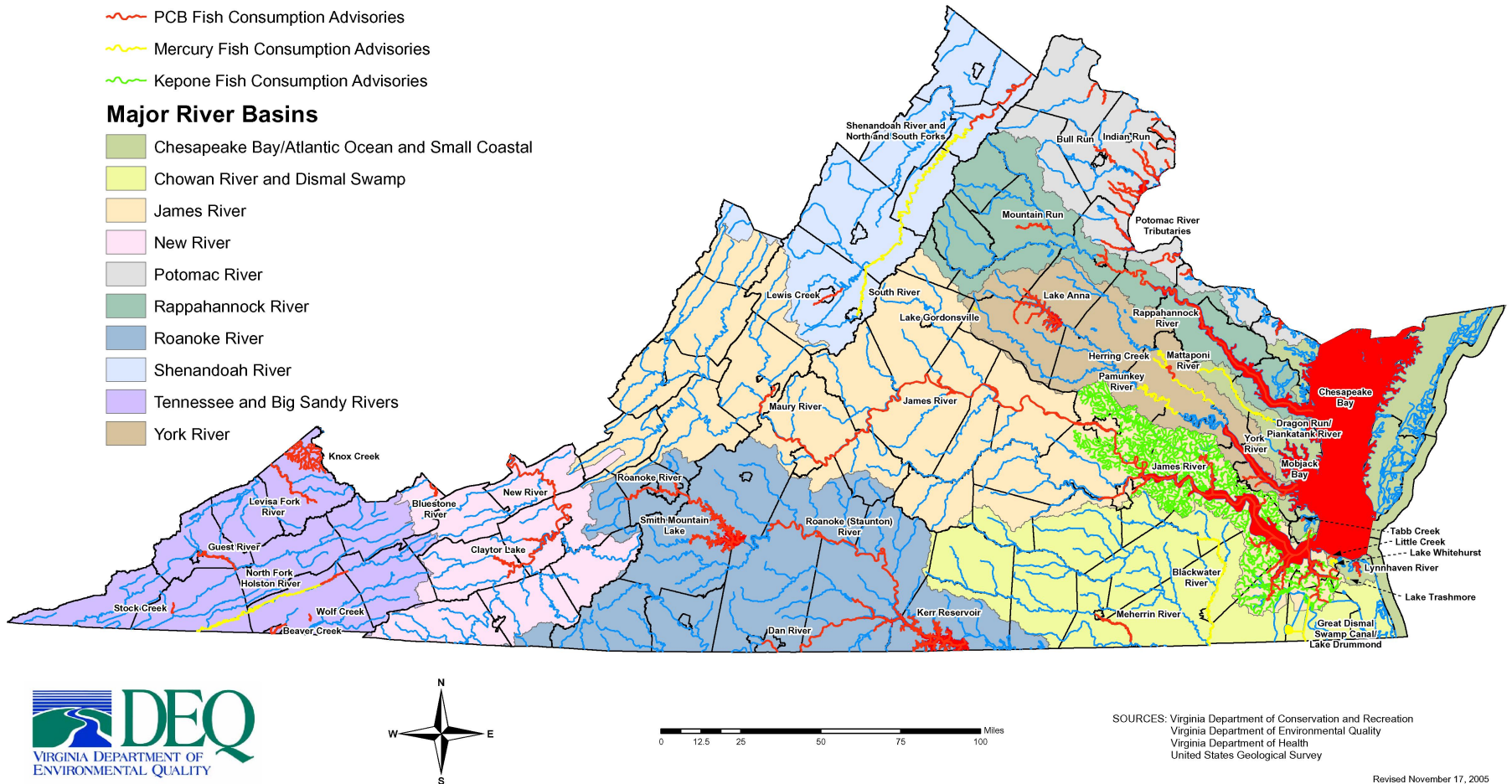
Trend Analysis Results

% of all stations	BACTERIA		TOTAL NITROGEN		TOTAL PHOSPHORUS		TOTAL SUSPENDED SOLIDS	
TIME BLOCK	degrading	improving	degrading	improving	degrading	improving	degrading	improving
1985 to present	1.1%	6.6%	6.1%	16.6%	1.6%	19.0%	2.6%	11.2%
1995 to present	1.0%	19.2%	4.3%	6.4%	1.8%	5.4%	2.6%	12.5%

- 261 stations
- Considered effects (including flow) over two time intervals:
 - 1985 to 2004 Long-Term
 - 1995 to 2004 Mid-Term
- 80% of stations had no significant trends
- 20% of stations showed some water quality trends

Waters Under VDH Fish Consumption Advisories

Identified in 2006 305(b)/303(d) Water Quality Integrated Report



A complete list of fish advisories in Virginia can be found at <http://www.vdh.state.va.us/HHControl/fishingadvisories.asp>

Public Beaches

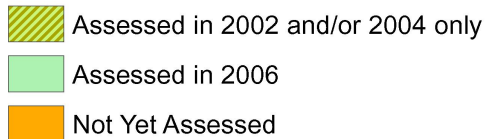
- 49 public beaches monitored by VDH
- Bacteria levels checked May – September
- May result in beach closures and swimming advisories
- 5 beaches impaired (data through 2004)
 - Fairview (Potomac River)
 - Anderson's, Hilton, Huntington, King Lincoln Park (James River)

2006 Assessed Area

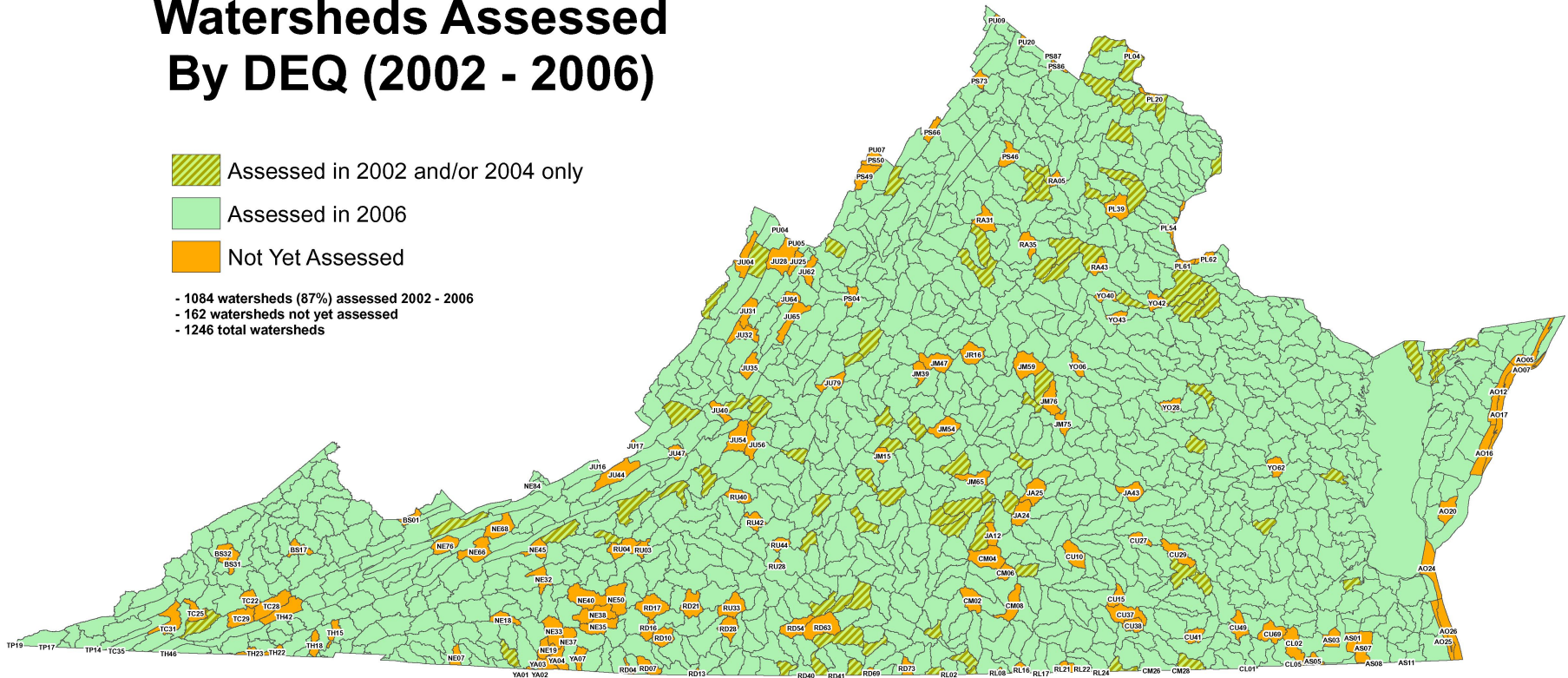
Waterbody Type	Total	Assessed	Attained Use	Impaired
Rivers (miles)	50,357	14,282	5,298	8,984
Lakes (acres)	116,058	112,479	3,271	109,208
Estuaries (sq. miles)	2,428	2,385	170	2,215

87% of Watersheds Assessed 2002 – 2006

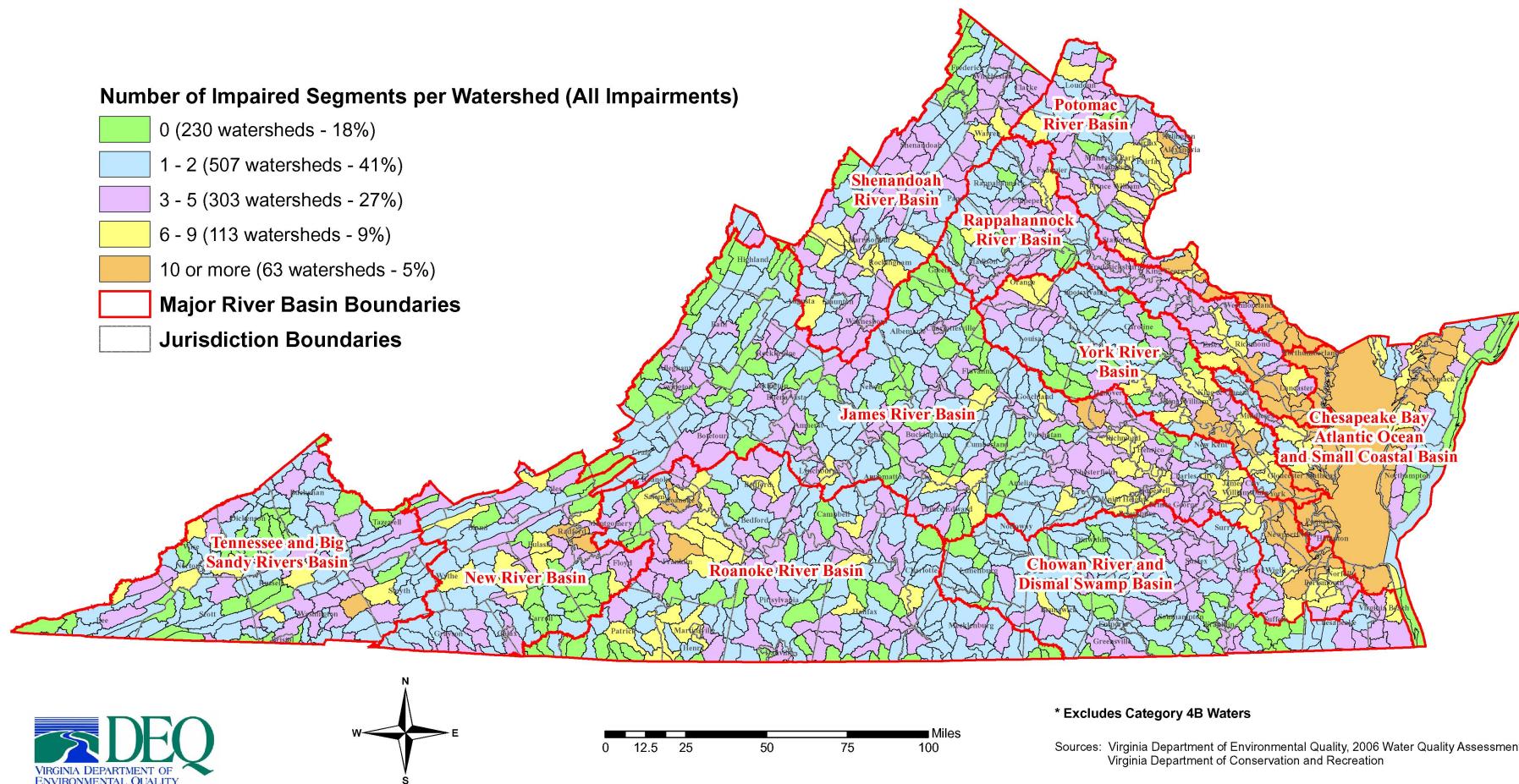
Watersheds Assessed By DEQ (2002 - 2006)



- 1084 watersheds (87%) assessed 2002 - 2006
- 162 watersheds not yet assessed
- 1246 total watersheds



Distribution of Impaired* Waters In Virginia's Watersheds



Impaired Area Identified Per Assessment Cycle by Waterbody Type

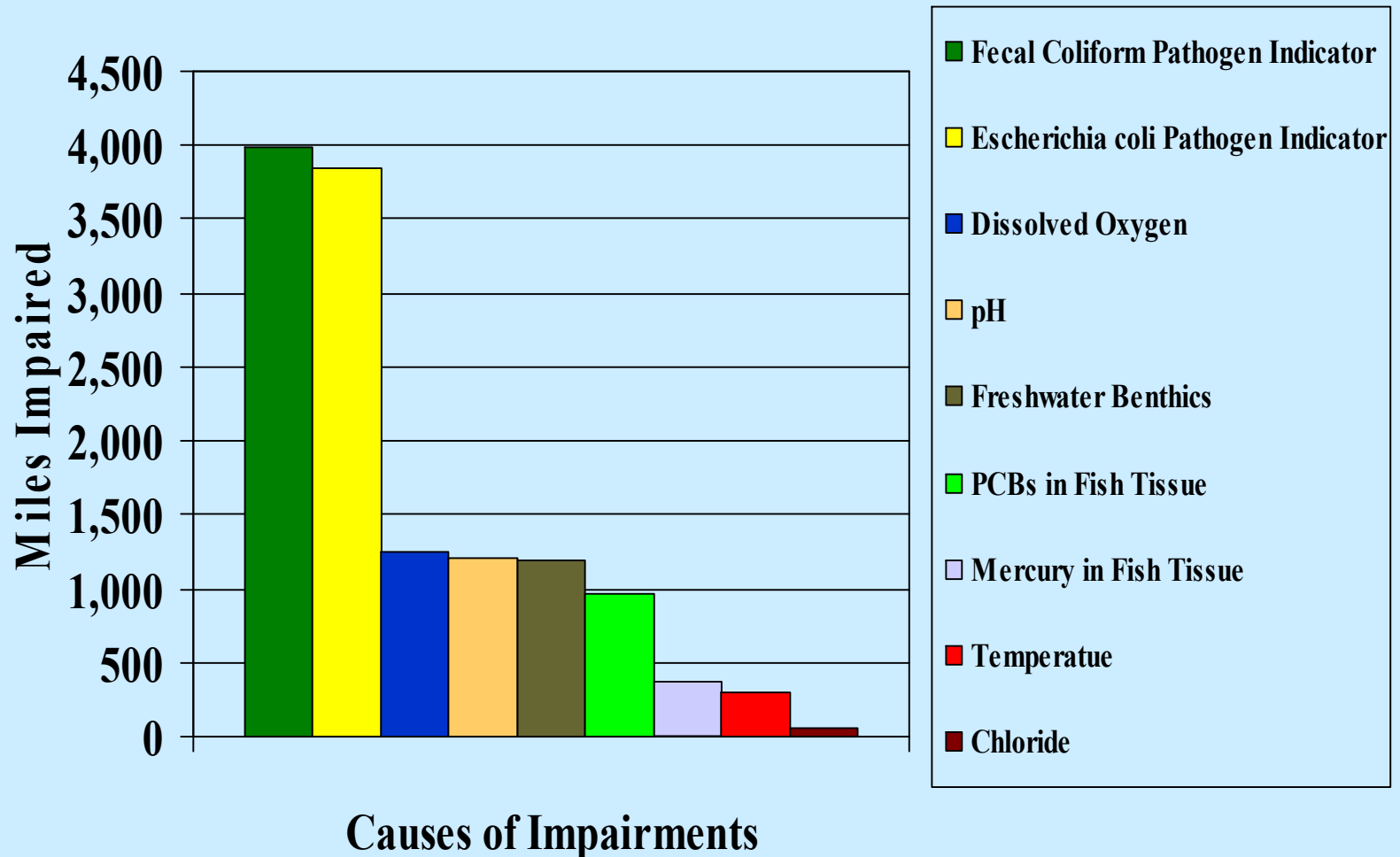
Waterbody Type	1996	1998	2002	2004	2006²
Rivers 50,357 (miles)	2,016	2,611	4,838	6,931	8,984
Lakes 116,058 (acres)	17,141	0	115,558 ¹	89,834	109,208
Estuaries 2,428 (sq. miles)	506	437	1,689	1,907	2,216

¹ Area included lakes shared by Virginia and North Carolina. 25,724 acres determined to be in North Carolina and removed from Virginia's 2004 total impaired acreage.

² Impaired area in 2006 includes impaired area in 2004 and earlier assessments.

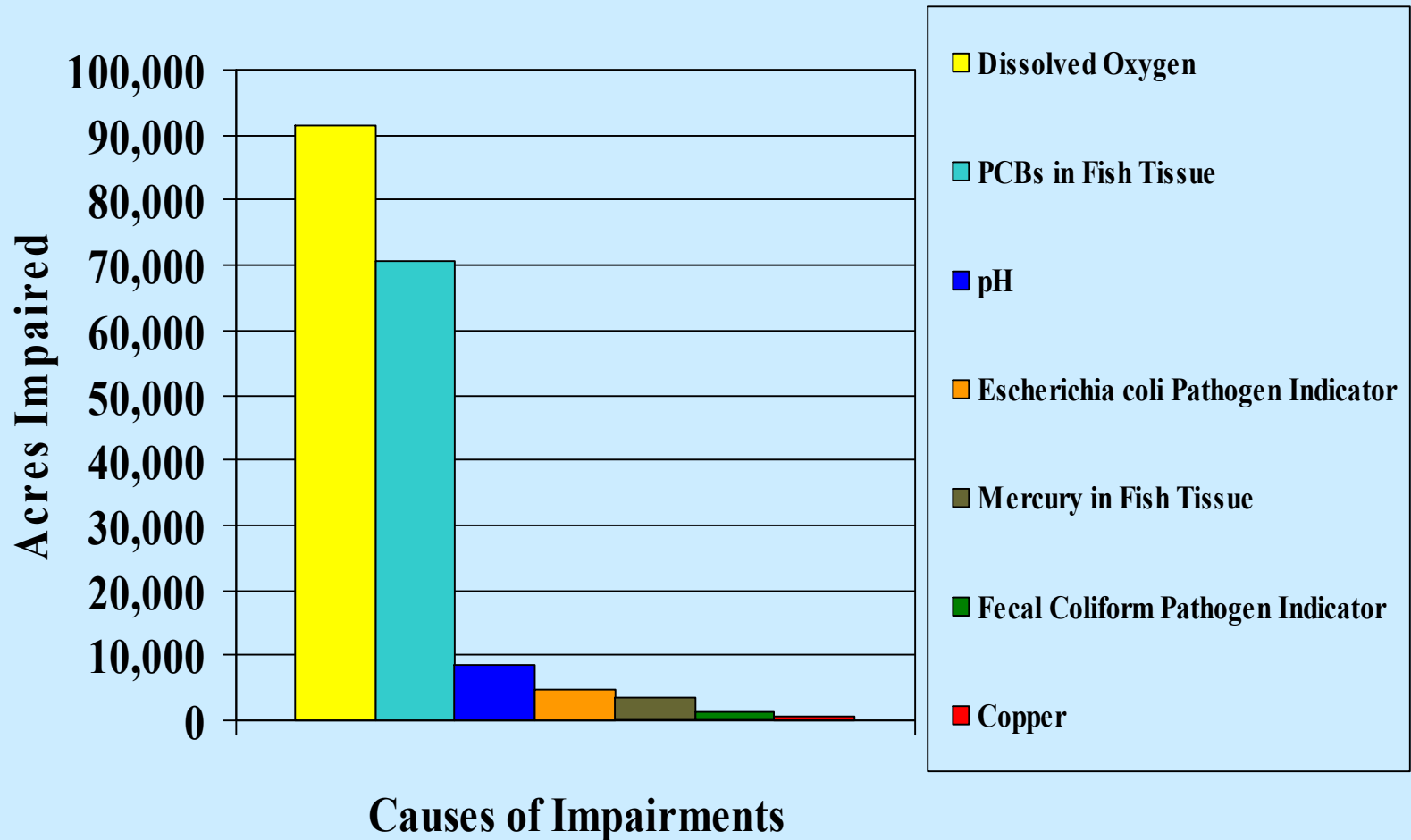
2006

Impairment Causes for Rivers



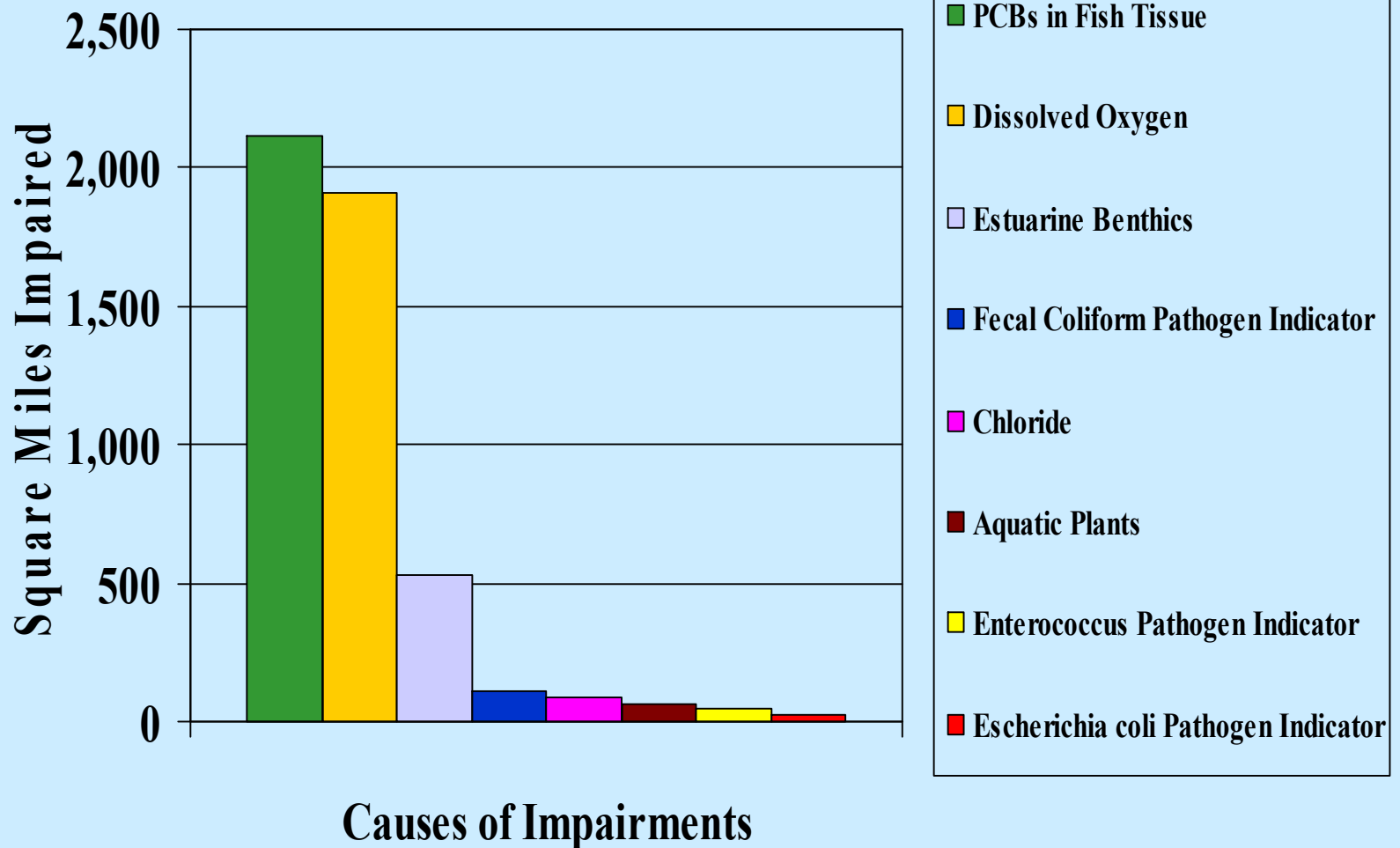
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Impairment Causes for Lakes



2006

Impairment Causes for Estuaries



Designated Uses

DESIGNATED USE	SUPPORT OF USE DEMONSTRATED BY
Aquatic Life Use (sub-divided in Chesapeake Bay and Tributaries)	Conventional Pollutants (Dissolved Oxygen, pH, Temp.); Nutrients and toxic contaminants found in sediments, toxics in water column; Biological evaluation
Fish Consumption Use	Advisories, limiting or restricting consumption (VDH); Exceeding state screening values for toxic pollutants found in fish tissue
Shellfish Consumption Use	Restricted harvesting and marketing of shellfish resources by Div of Shellfish Sanitation of VDH
Swimming Use	Conventional Pollutant (Fecal Coliform Bacteria, E. coli, enterococci) and/or beach closures issued by VDH
Public Water Supply Use	Closures or advisories by VDH; comparison of data to applicable public water supply standards
Wildlife Use	Aquatic life toxics criteria in water column

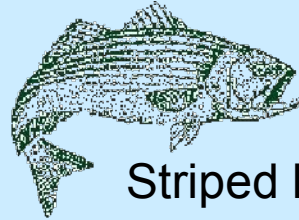
Chesapeake Bay - Aquatic Life Sub-uses

- Shallow Water - (SAV and Water Clarity)
- Spawning and Nursery (February - May)
 - Not assessed in 2006
- Open Water (Varies w/season)
- Deep Water (Summer Only)
- Deep Channel (Summer Only)
 - Not assessed in 2006

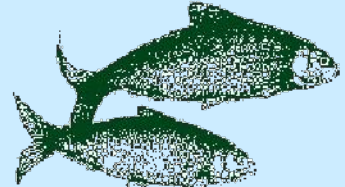
Oxygen Requirements (mg/L) of Bay Species

Migratory Fish Spawning
& Nursery Areas

6



Striped Bass: 5-6



American Shad: 5

Shallow and Open Water
Areas

5



White Perch: 5



Yellow Perch: 5

4



Hard Clams: 5



Alewife: 3.6

Deep Water

3



Crabs: 3



Bay Anchovy: 3

2

Deep Channel

1



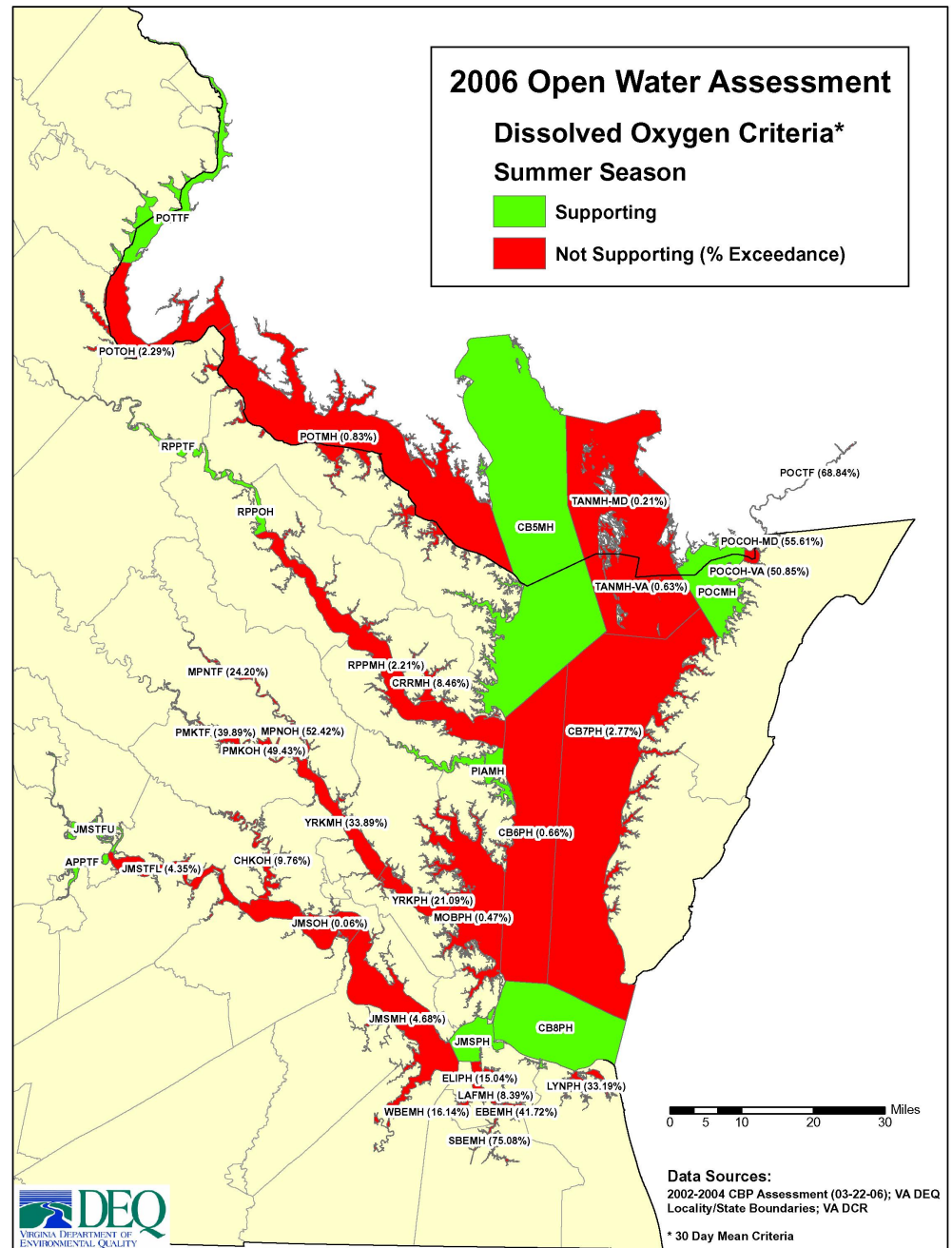
Spot: 2



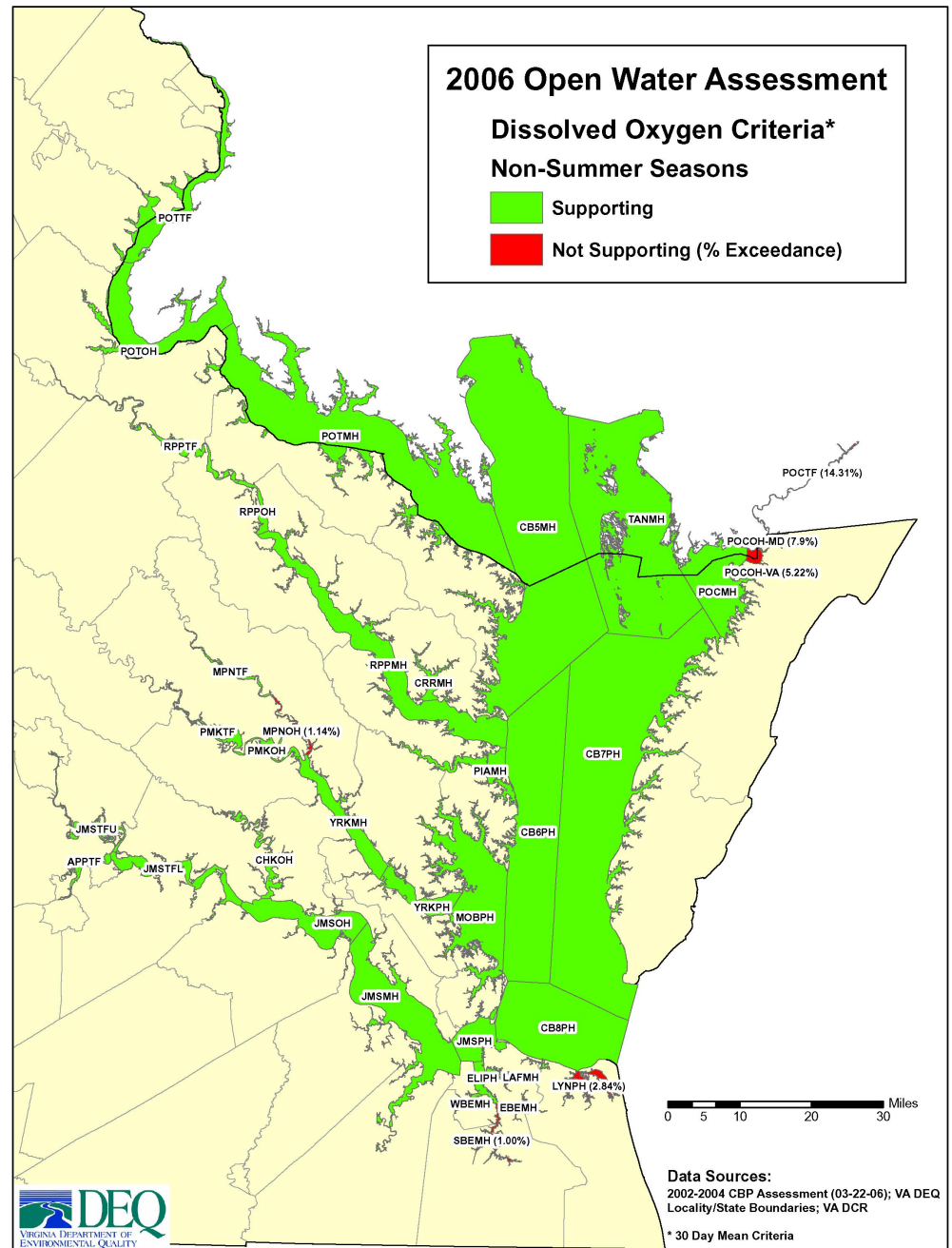
Worms: 1

0

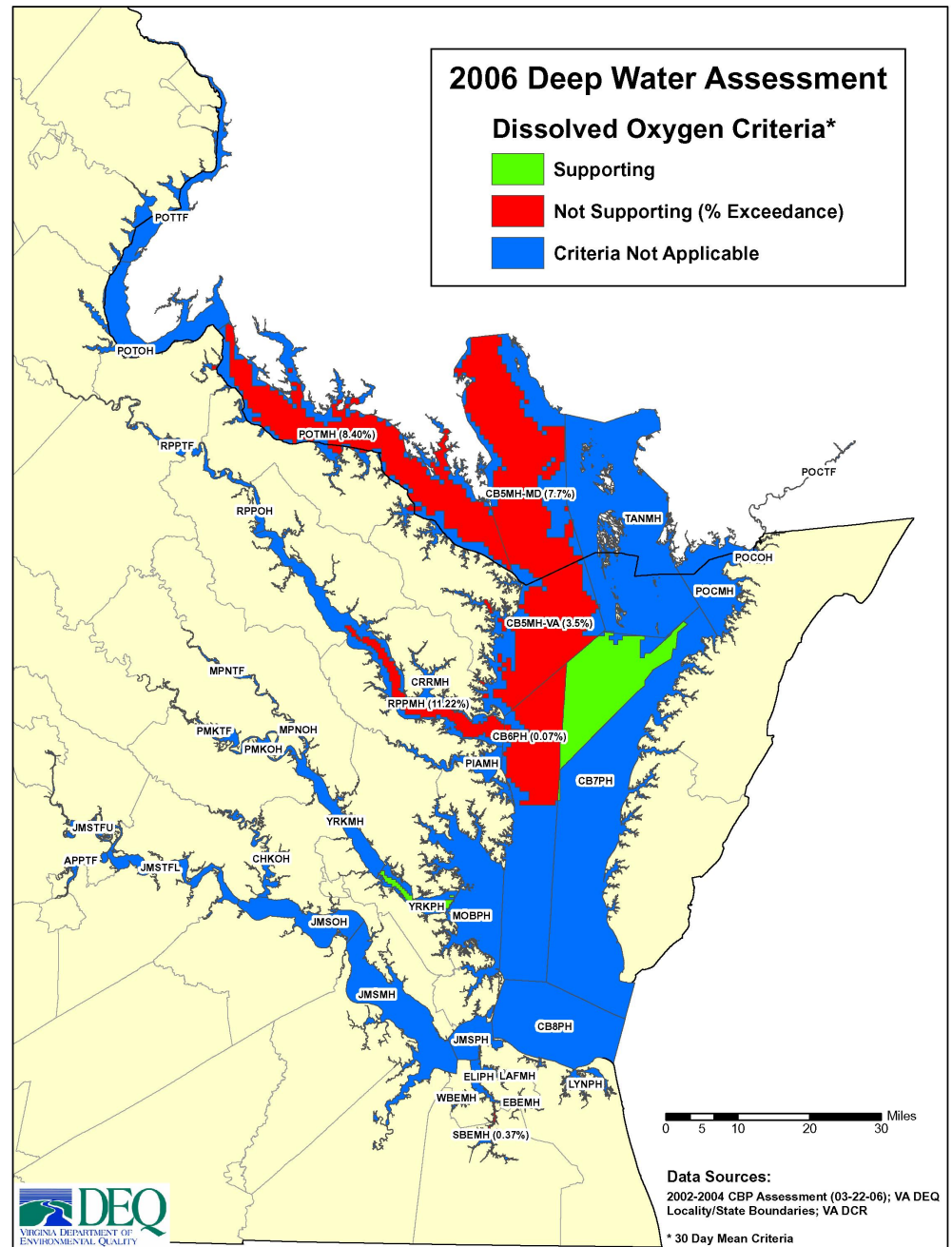
- Level of summer DO is better in the mainstem Bay than in some rivers
- Some sections of Bay and tidal fresh rivers meet DO criteria all year



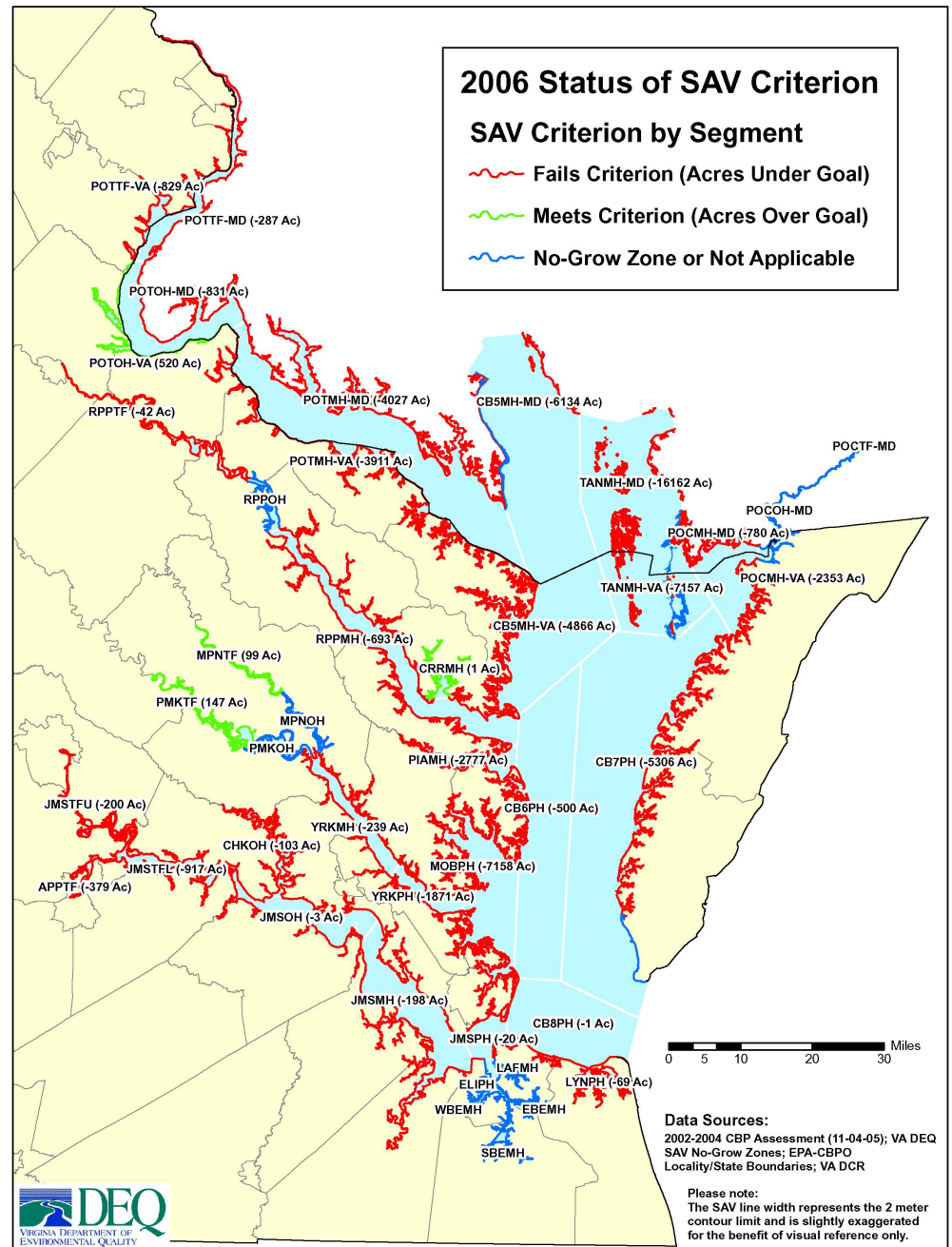
- Non-summer DO in attainment everywhere except portions of Lynnhaven and Elizabeth Rivers
- Areas of failure have < 3% time and volume exceedance



- Use applies only in summers and only in very limited areas
- Mainstem Bay in Virginia $\leq 4\%$ time and volume exceedance



- SAV goal for Virginia is 77,463 acres
- 38,640 acres existing
- 38,823 acre shortfall in 2006



EPA Integrated List

EPA Assessment Categories (since 2004)

- Major Change To Assessment Approach
- 1 - Fully Support All Designated Uses
- 2 - Fully Support All Uses Assessed
- 3 - Insufficient Data
- 4 - Impaired (No TMDL Needed)
- 5 - Impaired (TMDL May Be Needed)
- Virginia added additional Subcategories in 2006 to help track TMDL implementation

New Impaired Water Listings

- New (Category 5A) Impairments in 2006
 - Excluding both shellfish and natural impairments
 - 1,059 miles of Rivers (and Streams)
 - 27,634 acres of Lakes (includes category shifts)
 - 362 square miles of Estuaries
 - Shifts between Categories 4 and 5 since 2004
 - All Category 4 and 5 Waters included in total impaired area
- 1712 total TMDLs to be developed (cumulative)

Delisting of Waters Since 2004 Report

- 381 River/Stream Miles Submitted to EPA for Approval to Delist in 2006
- 83 (Category 4B) Waters Approved For Delisting In Late 2004 and 2005 (VPDES facilities w/amended permits)

Steps in TMDL Process

- Place Impaired Waters on 303(d) List due to Water Quality Standards violations
- Develop TMDL - Total Maximum Daily Load - for Impaired Waters - 381 through May 2006
- Develop TMDL Implementation Plan
 - 13 completed for 36 waters; 10 more in progress
- Implement TMDL Plan -11 w/“BMPs installed”
- Remove Waters from 303(d) List when Water Quality Standards achieved

2006 Legislation

HB 1150 – Chesapeake Bay and Virginia Waters Clean-up and Oversight Act

- Secretary of Natural Resources to develop a strategic plan by January 1, 2007 for cleanup of Virginia impaired waters
- The plan is to include:
 - Measurable, attainable objectives
 - Strategies and time frames
 - Funding and disbursement plans
 - Problem areas and risk mitigation strategies
 - Recommendations for legislative action
- Plan to be revised and updated as needed
- Semi-annual progress reports to General Assembly committees
- Meetings of committees to hear testimony or discuss specific initiatives requiring legislative action

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QUESTIONS?

Integrated List - VA Subcategories

- Category 1 - Fully Support All Uses
 - *Virginia 1A* - TMDL Developed, Attaining All Uses
- Category 2 - Fully Support All Uses Assessed
 - Virginia 2A - Support All Monitored Uses
 - Virginia 2B - Waters Of Concern But No Water Quality Standard Exists, Or A Screening Value Was Exceeded
 - *Virginia 2C* - TMDL Developed, Attaining Use For Which It Was Originally 303(d) Listed But Insufficient Data for Some Uses

Integrated List - VA Subcategories

- Category 3 - Insufficient Data
 - Virginia 3A - No Data Available
 - Virginia 3B - Data Available But Insufficient Quantity
 - Virginia 3C - Citizen Monitoring Indicates Problem
 - Waters Evaluated And Prioritized For Follow-Up Monitoring
 - 31 Citizen-Identified Waters Scheduled for DEQ Monitoring (in 2007)
 - Virginia 3D - Citizen Monitoring Indicates No Problems

Integrated List - VA Subcategories

- Category 4 - Impaired TMDL Not Needed
 - Virginia 4A - TMDL Developed and EPA Approved
 - Virginia 4B - Other Regulatory Requirements Will Assure Attainment In Near Future (e.g. NPDES)
 - Virginia 4C - Impairment Caused By Pollution
- Pollution - No Polluting Substance (e.g. flow)
- Pollutant - Polluting Substance (e.g. bacteria)

Integrated List - VA Subcategories

- Category 5 - Impaired, TMDL May Be Needed
 - Virginia 5A - Non-Shellfish (TMDL Required)
 - Virginia 5B - Shellfish (TMDL Required)
 - Virginia 5C - Naturally Impaired
 - Study needed to determine if wholly or partially impaired
 - Designated use and water quality standard may be changed
 - Virginia 5D - TMDLs Developed For Some Causes
Additional TMDL(s) Needed For Other Causes
 - Virginia 5E - Effluent Limited Waters With Compliance
Schedule After The Next Assessment Date
 - ***Virginia 5F*** - Delisting Approved, But The Water Remains
Impaired Due To Other Causes